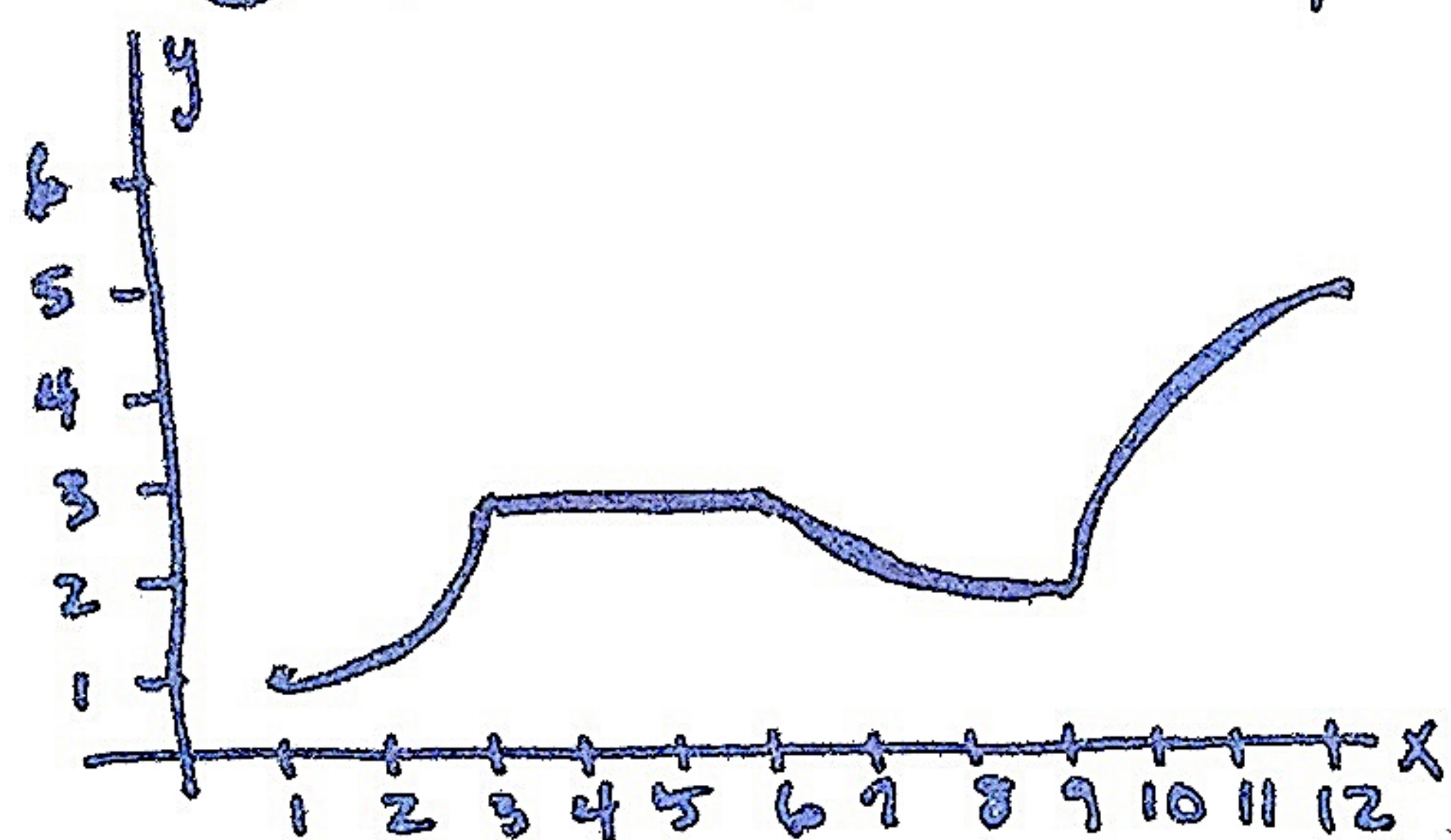


#12 ANSWER "POSITIVE", "NEGATIVE", OR "ZERO"



a) $f'(2)$

c) $f'(4)$

e) $f'(7)$

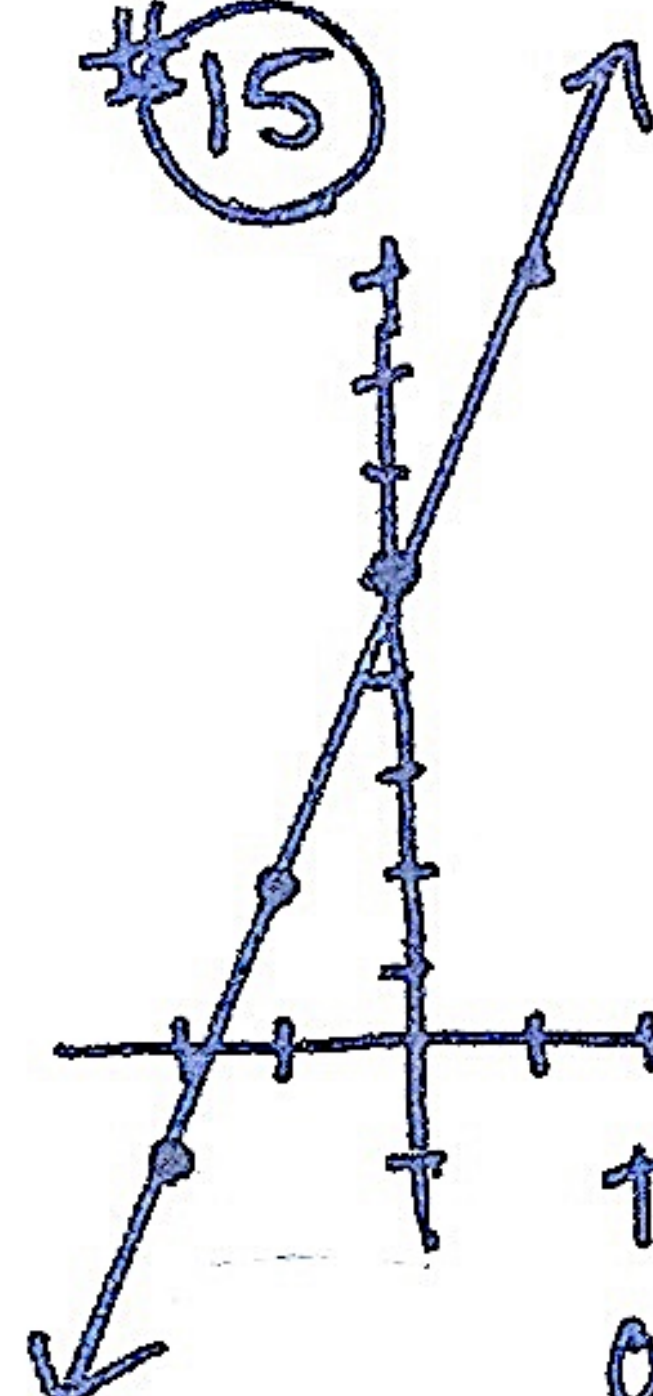
b) SLOPE IN INTERVAL (1, 3)

d) SLOPE IN INTERVAL (3, 6)

f) SLOPE IN INTERVAL (6, 9)

g) SLOPE IN INTERVAL (9, 12)

#15



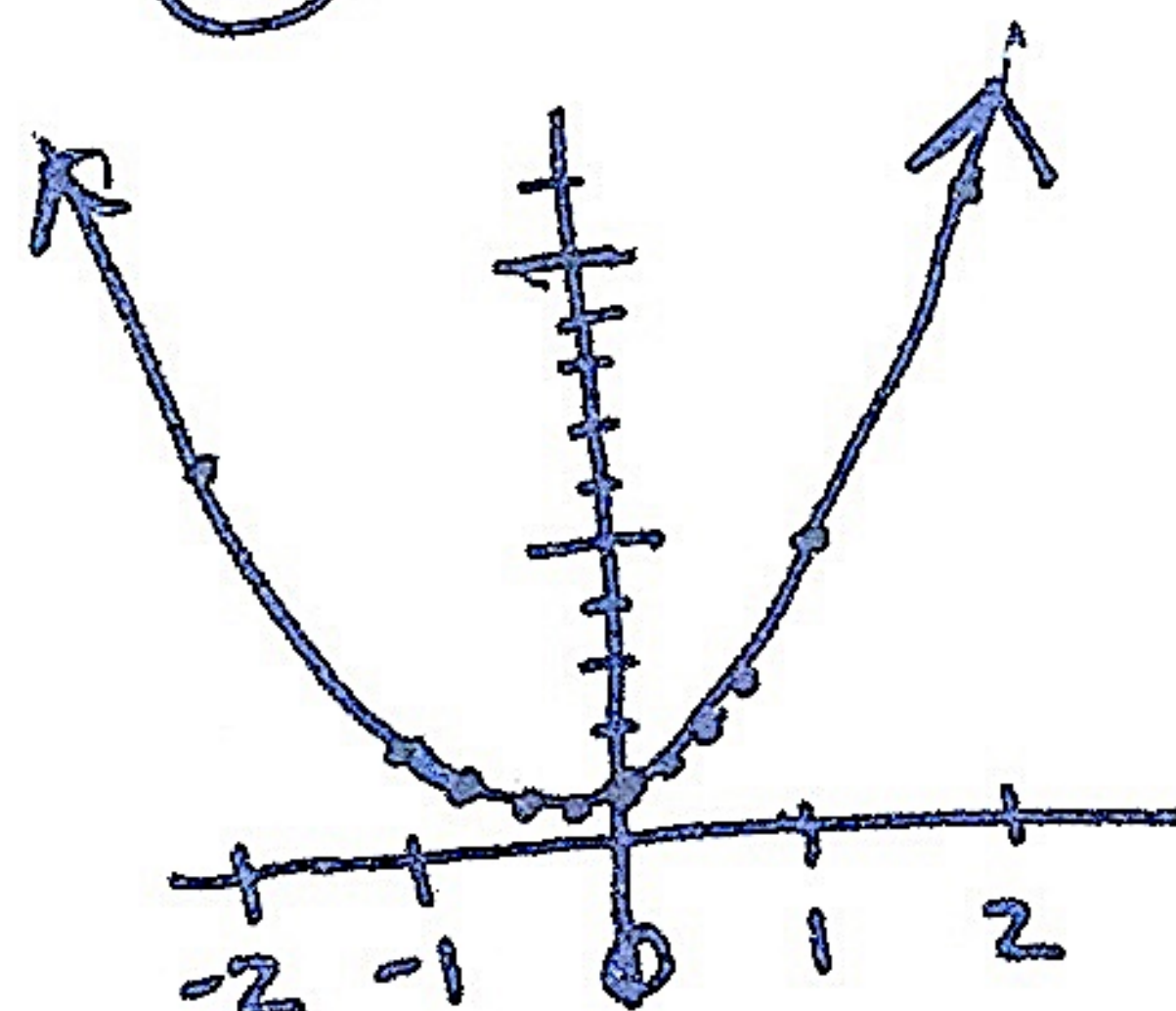
$$f(x) = 3x + 5$$

$$f'(x) = 3$$

USE THE DERIV. TO DETERMINE IF THE SLOPE IS POSITIVE, NEGATIVE, OR ZERO FOR EACH POINT IN THE TABLE. THEN DETERMINE THE INTERVAL(S) OVER WHICH $f(x)$ IS INCREASING AND OVER WHICH $f(x)$ IS DECREASING.

x	f(x)	f'(x)
-2	-1	
-1	2	
0	5	
1	8	
2	11	
3	14	
4	17	

#17



$$f(x) = 2x^2 + x + 1$$

$$f'(x) = 4x + 1$$

SAME INSTRUCTIONS AS #15 ABOVE

x	f(x)	f'(x)
-2	7	
-1	2	
-0.75	1.375	
-0.5	1	
-0.25	0.875	
0	1	
0.25	1.375	
0.5	2	
0.75	2.875	
1	4	
2	11	

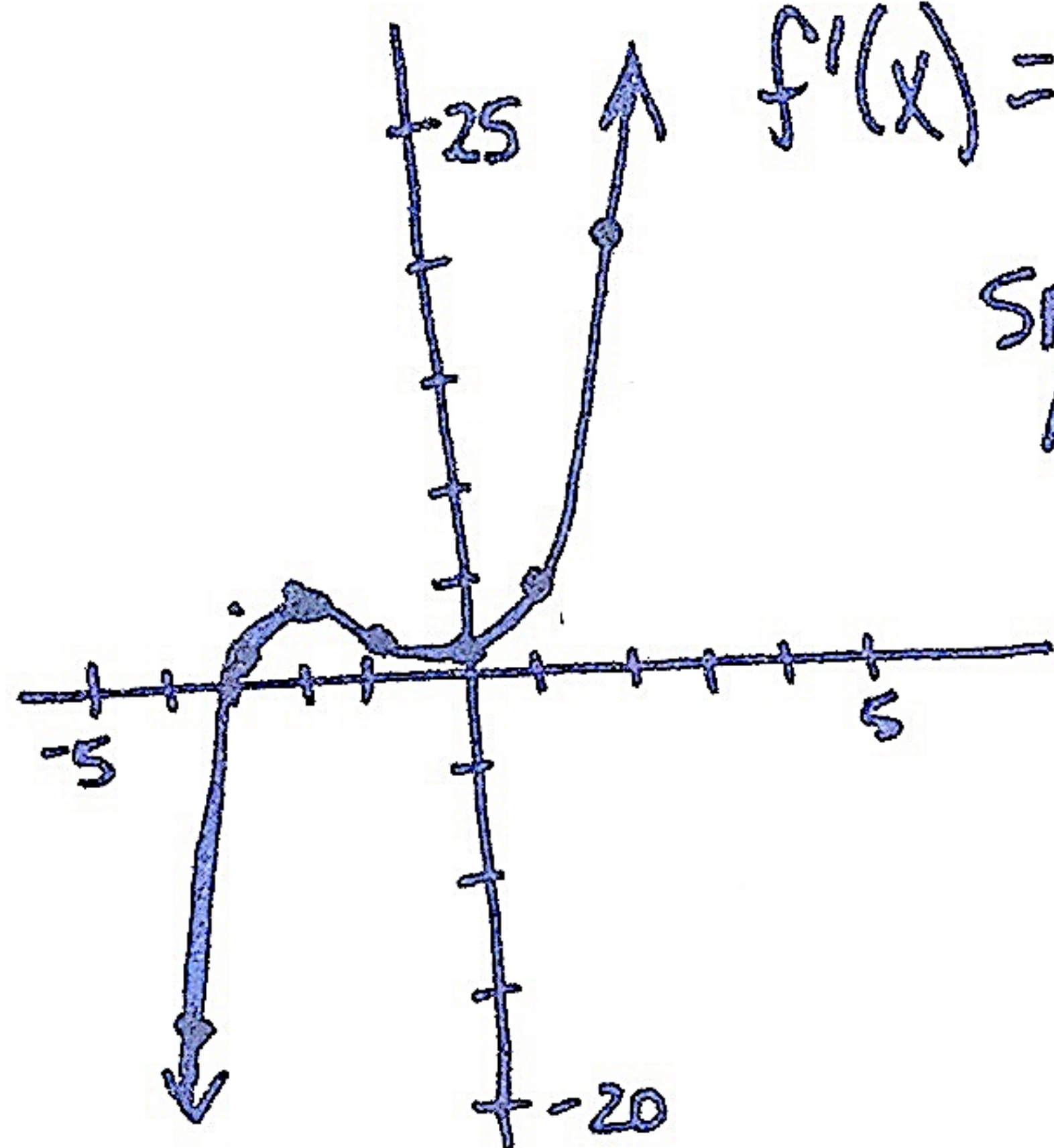
4.1

#21

$$f(x) = x^3 + 3x^2 + 1$$

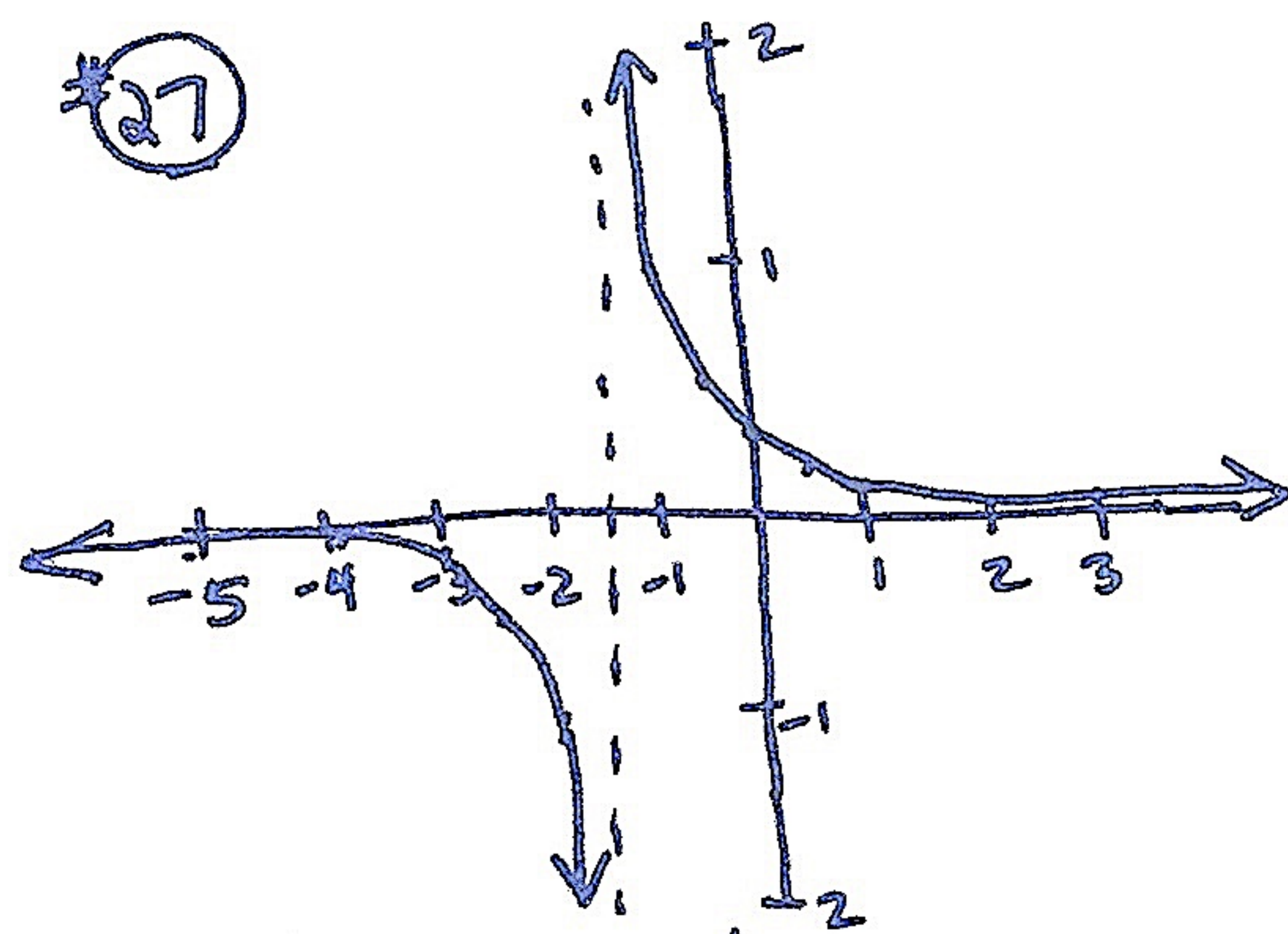
$$f'(x) = 3x^2 + 6x$$

SAME INSTRUCTIONS
AS #15 ON
PREVIOUS PAGE



x	f(x)	f'(x)
-4	-15	
-3	1	
-2	5	
-1	3	
0	1	
1	5	
2	21	

#27



$$f(x) = \frac{1}{(2x+3)}$$

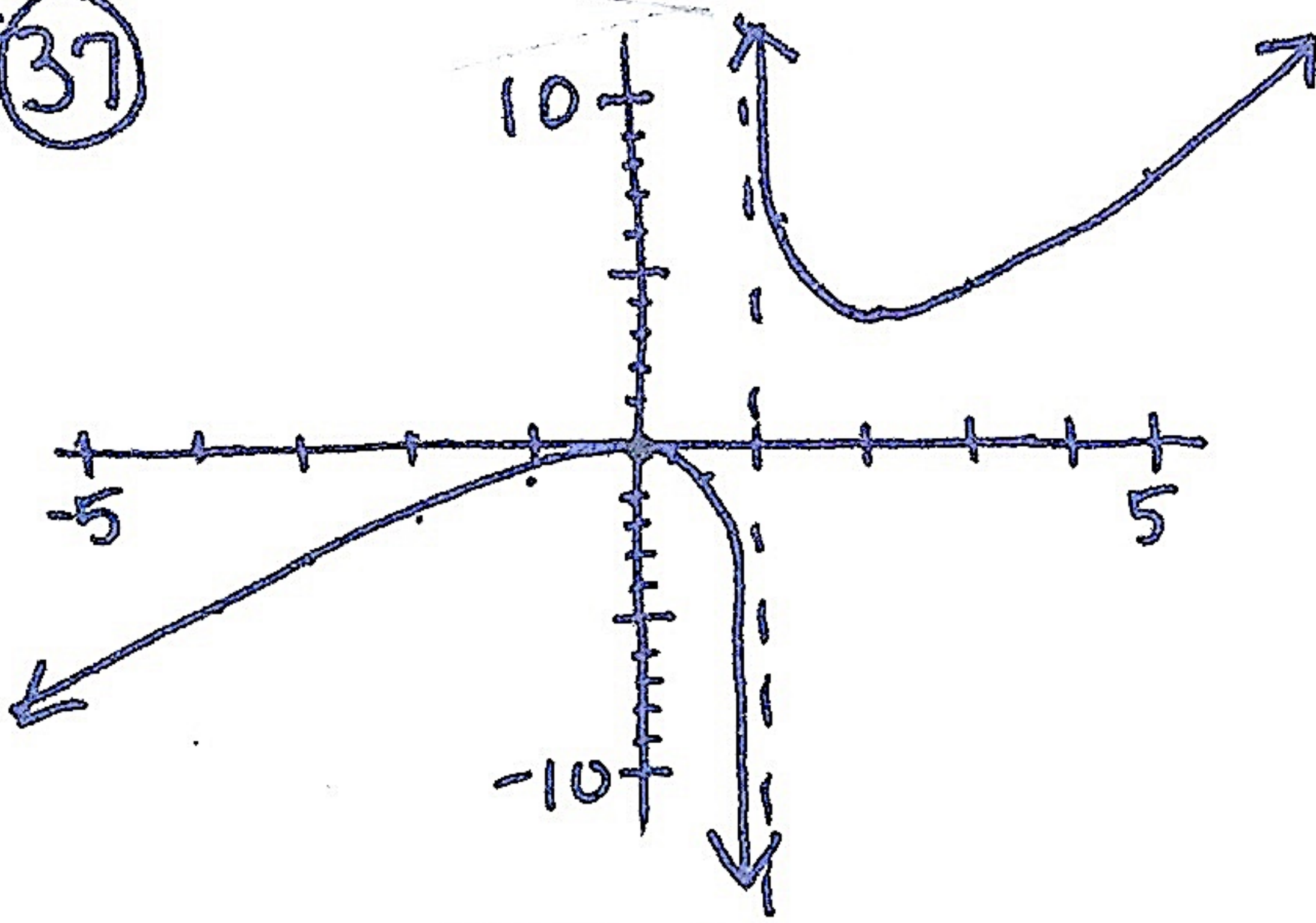
$$f'(x) = \frac{-2}{(2x+3)^2}$$

SAME INSTRUCTIONS
AS #15 ON
PREVIOUS PAGE

x	f(x)	f'(x)
-5	-.1429	
-4.5	-.1667	
-4	-.2000	
-3.5	-.2500	
-3	-.3333	
-2.5	-.5000	
-2	-1	
-1.5	ERROR	
-1	1	
-0.5	0.5000	
0	0.3333	
0.5	0.2500	
1	0.2000	
1.5	0.1667	
2	0.1429	
2.5	0.1250	
3	0.1111	

4.1

#37



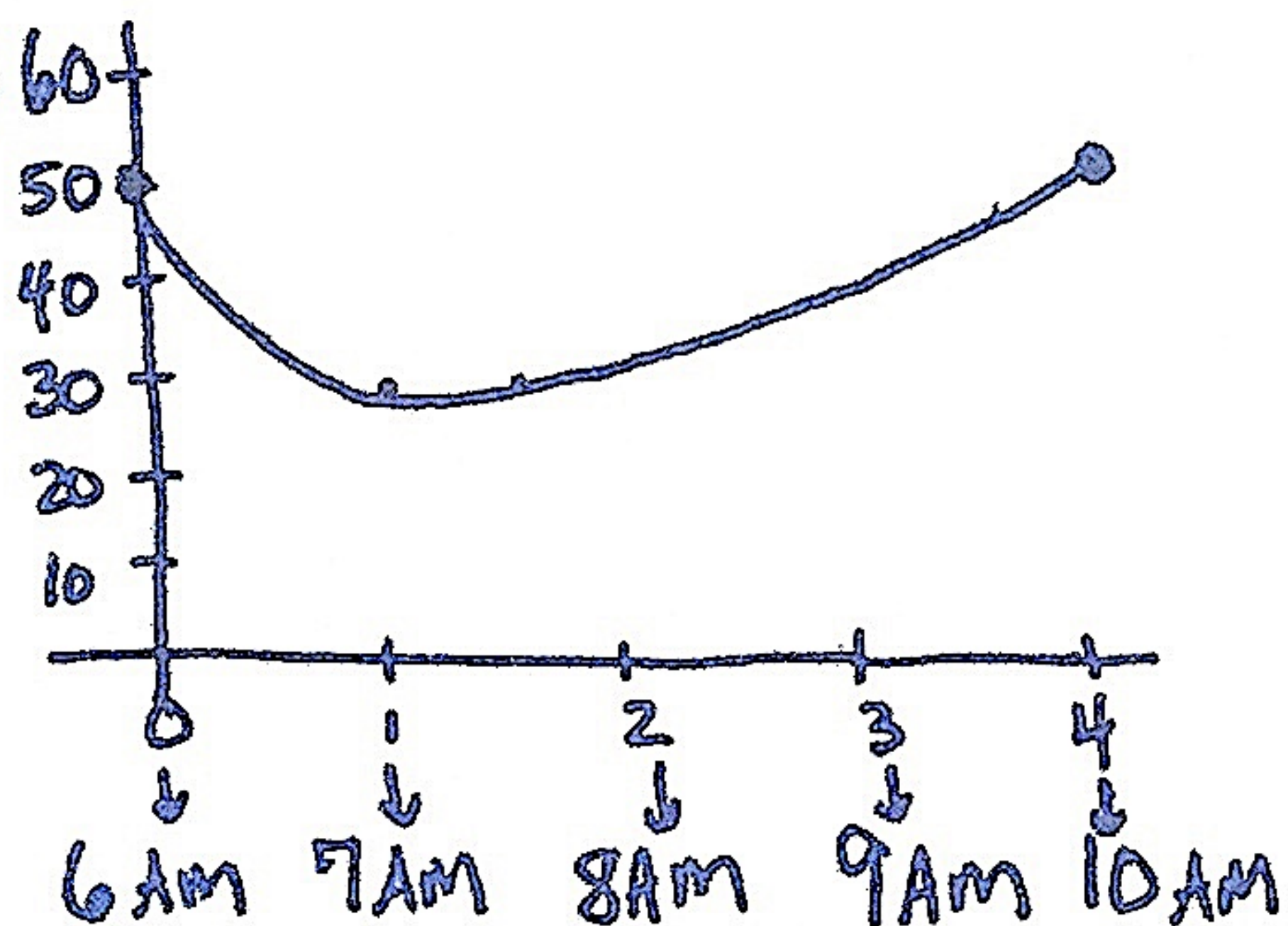
$$f(x) = \frac{x^2}{(x-1)}$$

$$f'(x) = \frac{(x^2 - 2x)}{(x-1)^2}$$

SAME INSTRUCTIONS
AS #15 ON
PREVIOUS PAGE

x	f(x)	f'(x)
-4	-3.2	
-3	-2.25	
-2	-1.33	
-1	-0.5	
0	0	
0.25	-.083	
0.5	-0.5	
0.75	-2.25	
1	ERROR	
1.25	6.25	
1.5	4.5	
1.75	4.083	
2	4	
3	4.5	
4	5.333	
5	6.25	

#83



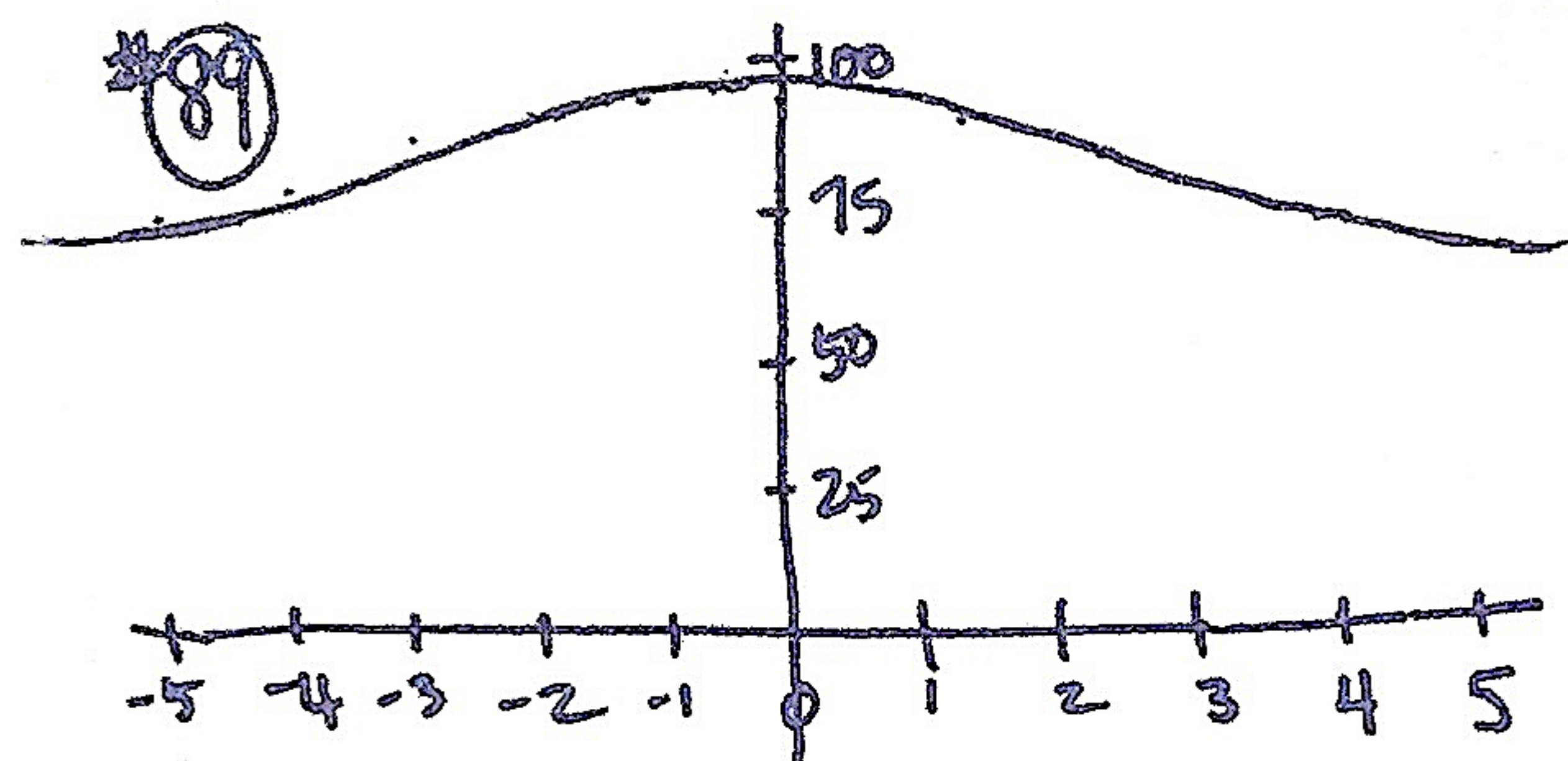
$$f(x) = 20x - 40\sqrt{x} + 50$$

$$f'(x) = 20 - \frac{20}{\sqrt{x}}$$

x	f(x)	f'(x)
0	50	
0.5	31.716	
1	30	
1.5	31.010	
2	33.431	
2.5	36.754	
3	40.718	
3.5	45.167	
4	50	

4.1

#89



$$f(x) = \frac{90.7}{(0.01x^2 + 0.01x + 1)}$$

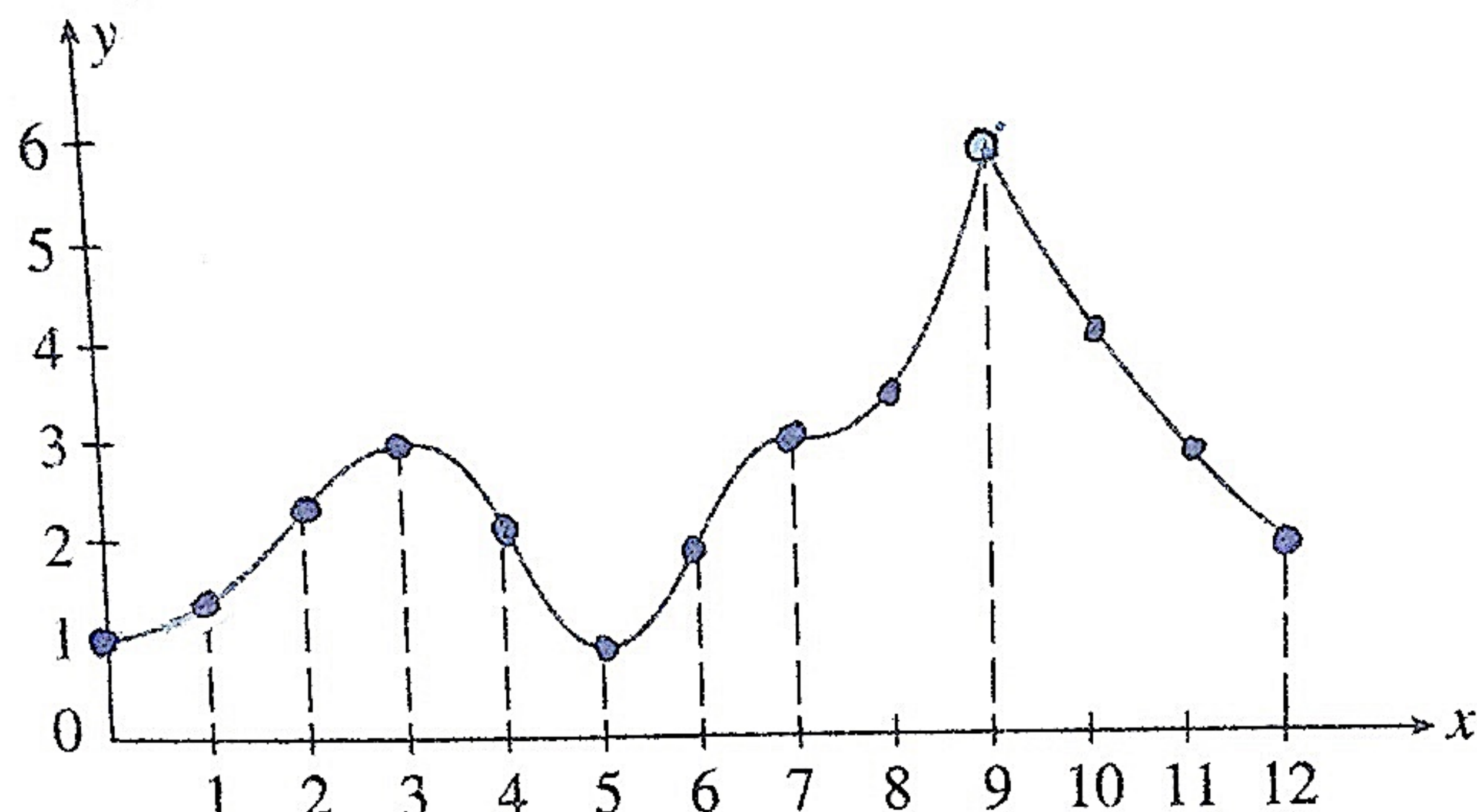
$$f'(x) = \frac{-90.7(0.02x + 0.01)}{(0.01x^2 + 0.01x + 1)^2}$$

WEEK 10 HW HELP

x	f(x)	f'(x)
-5	75.583	
-4	80.982	
-3	85.566	
-2	88.922	
-1	90.7	
-.75	90.870	
-.5	90.927	
-.25	90.870	
(2008) 0	90.7	
(2009) 1	88.922	
(2010) 2	85.566	
(2011) 3	80.982	
(2012) 4	75.583	

4.2

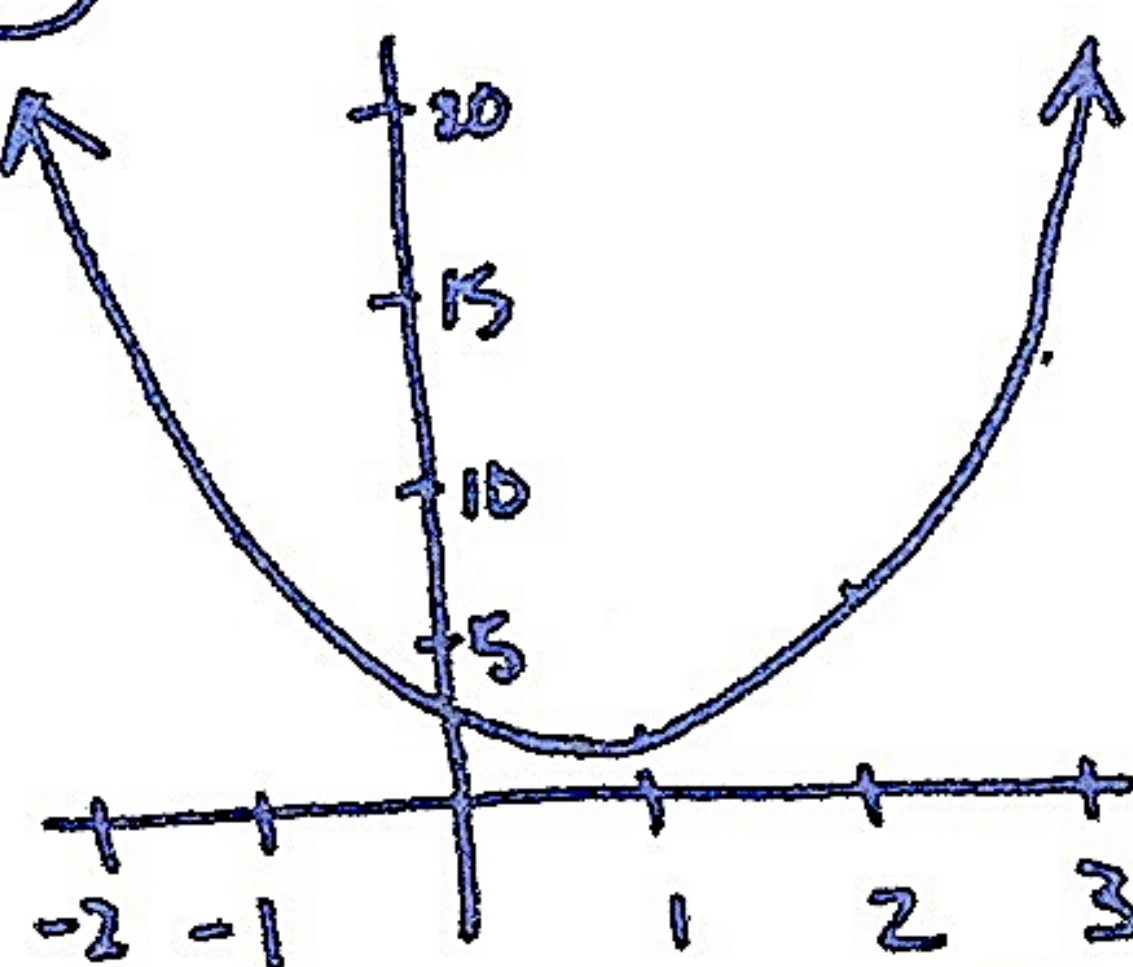
*9 (a) FOR EACH INTERVAL, WRITE "CONCAVE UP" OR "CONCAVE DOWN"



- i) INTERVAL (0, 2)
- ii) INTERVAL (2, 4)
- iii) INTERVAL (4, 6)
- iv) INTERVAL (6, 7)
- v) INTERVAL (7, 9)
- vi) INTERVAL (9, 12)

(b) A POINT OF INFLECTION OCCURS AT $x = \underline{\hspace{1cm}}$, $x = \underline{\hspace{1cm}}$, $x = \underline{\hspace{1cm}}$, AND $x = \underline{\hspace{1cm}}$

*29



$$f(x) = 2x^2 - 3x + 4$$

$$f'(x) = 4x - 3$$

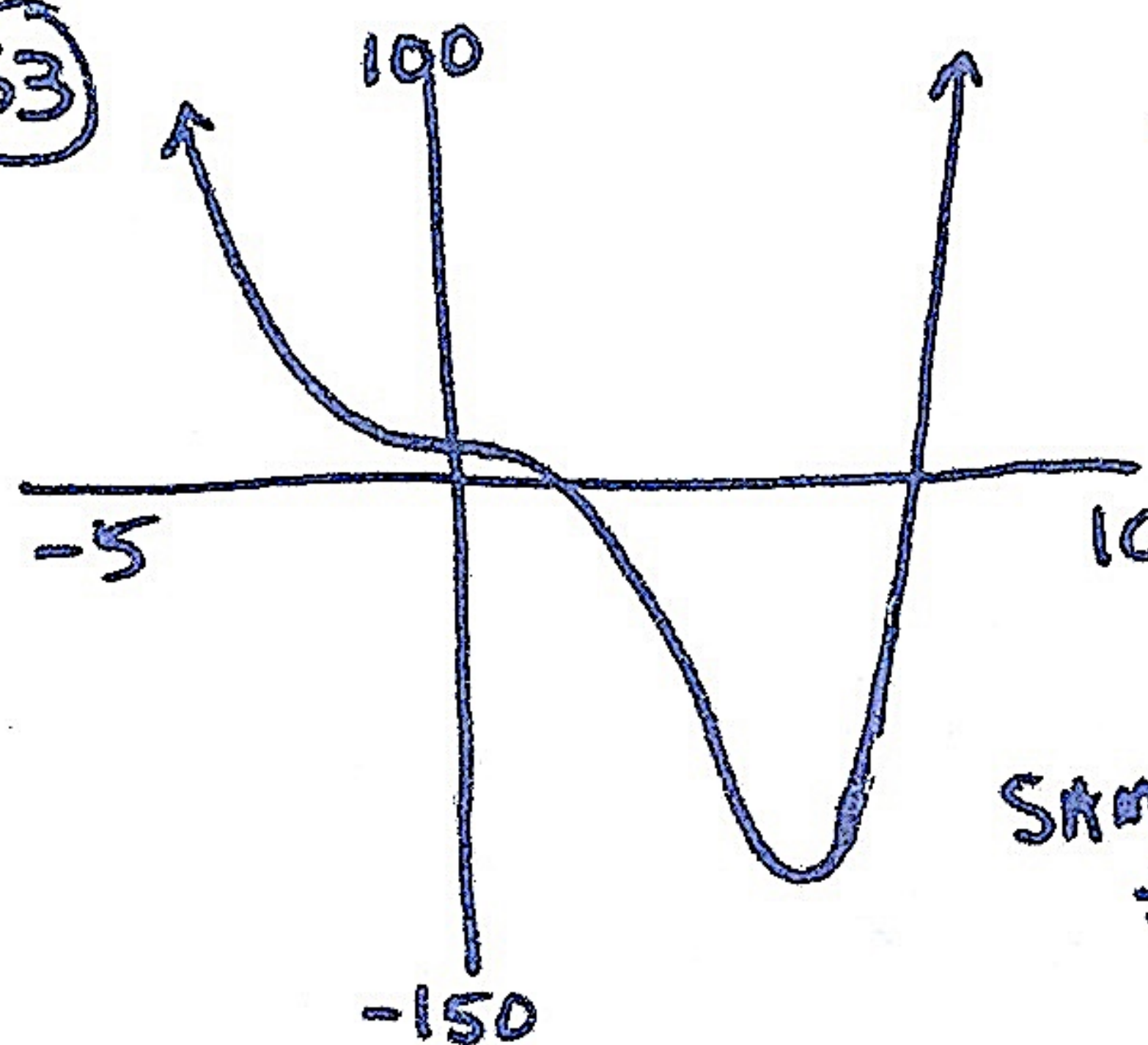
$$f''(x) = 4$$

USE THE SECOND DERIV.
TO DETERMINE WHETHER
CONCAVITY IS POSITIVE, NEGATIVE, OR ZERO
FOR EACH POINT IN THE TABLE. →

x	$f(x)$	$f''(x)$
-2	18	
-1	9	
0	4	
1	3	
2	6	
3	13	

THEN DETERMINE THE INTERVAL(S) OVER WHICH $f(x)$
IS CONCAVE UP AND OVER WHICH $f(x)$ IS CONCAVE DOWN.

*33



$$f(x) = x^4 - 6x^3 + 2x + 8$$

$$f'(x) = 4x^3 - 18x^2 + 2$$

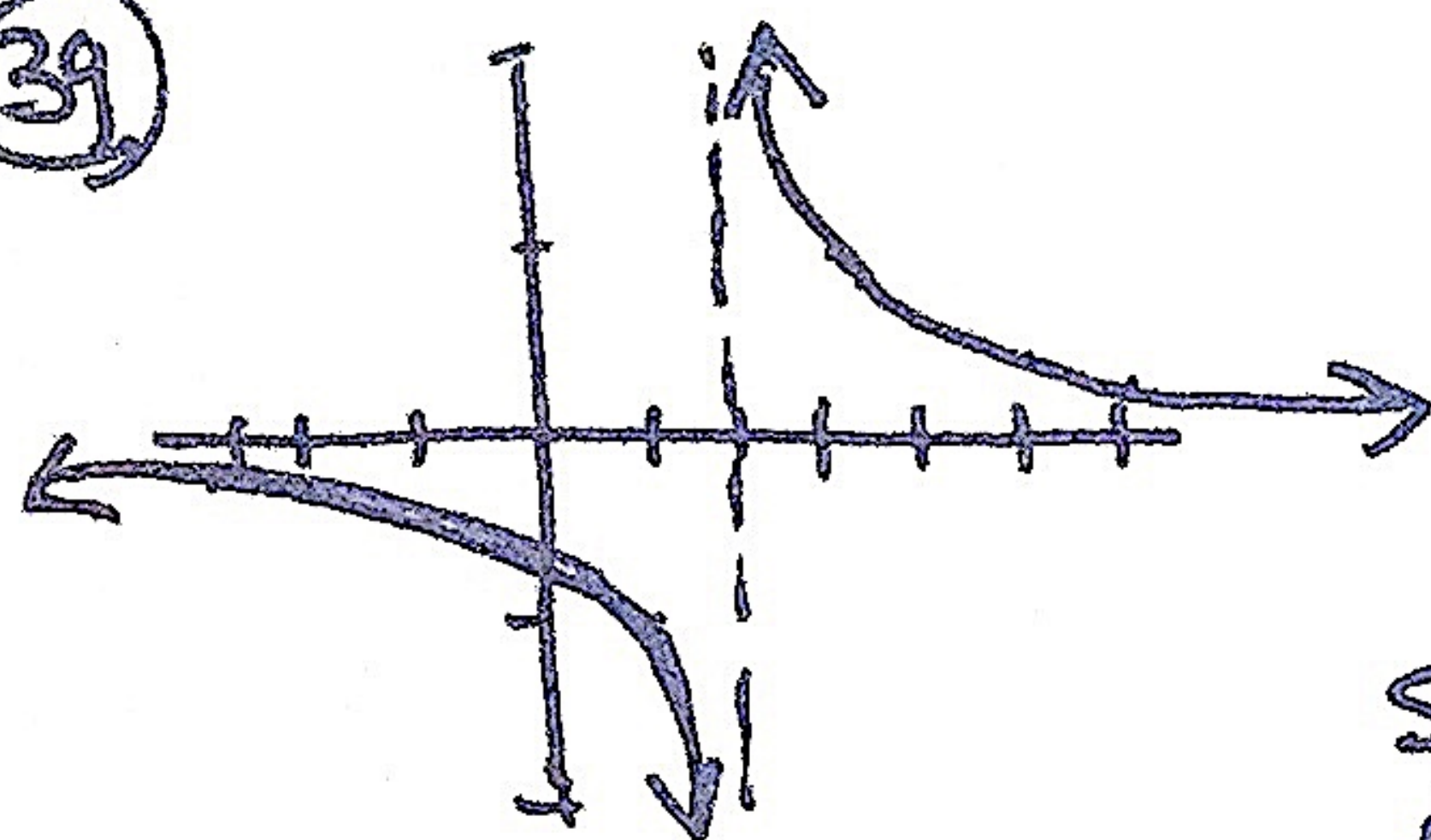
$$f''(x) = 12x^2 - 36x$$

SAME INSTRUCTIONS AS
#29 ABOVE

x	$f(x)$	$f''(x)$
-3	245	
-2	68	
-1	13	
0	8	
1	5	
2	-20	
3	-67	
4	-112	
5	-107	
6	20	

4.2

#39



$$f(x) = \frac{1}{(x-2)}$$

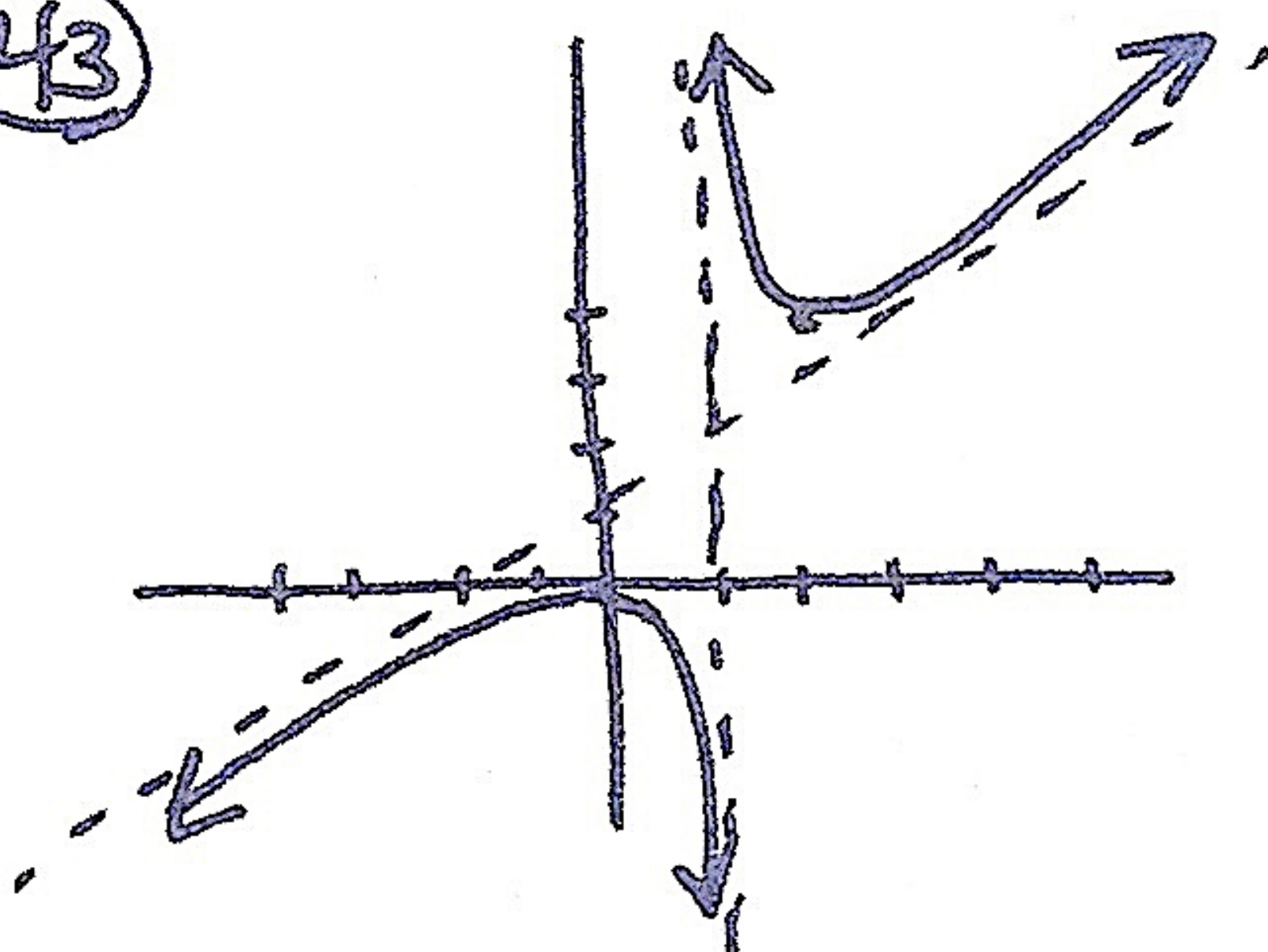
$$f'(x) = \frac{-1}{(x-2)^2}$$

$$f''(x) = \frac{2}{(x-2)^3}$$

SAME INSTRUCTIONS
AS #29 ON
PREVIOUS PAGE

x	f(x)	f''(x)
-3	-.2	
-2	-.25	
-1	-.33	
0	-.5	
1	-1	
2	ERROR	
3	1	
4	.5	
5	.33	
6	.25	

#43



$$f(x) = \frac{x^2}{(x-1)}$$

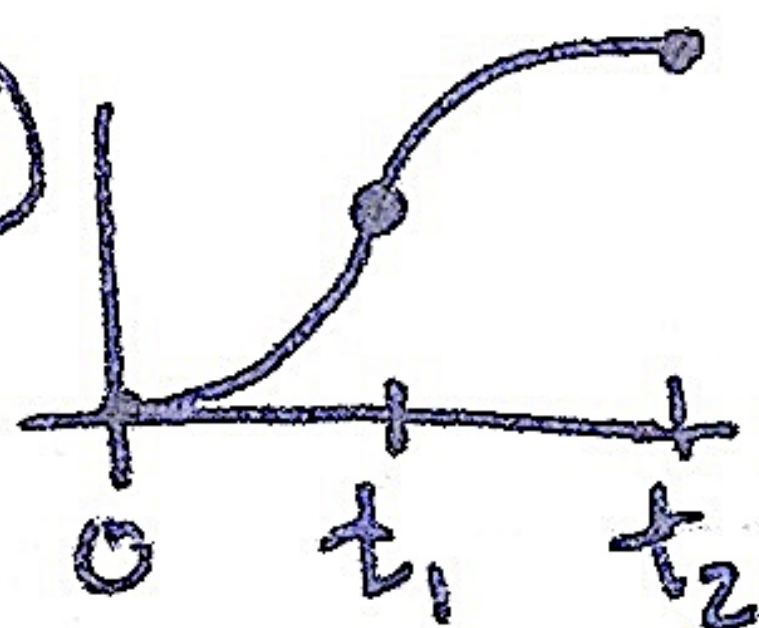
$$f'(x) = \frac{(x^2 - 2x)}{(x-1)^2}$$

$$f''(x) = \frac{2}{(x-1)^3}$$

SAME INSTRUCTIONS
AS #29 ON PREVIOUS PAGE

x	f(x)	f''(x)
-2	-1.333	
-1	-0.5	
0	0	
1	ERROR	
2	4	
3	4.5	
4	5.333	

#85

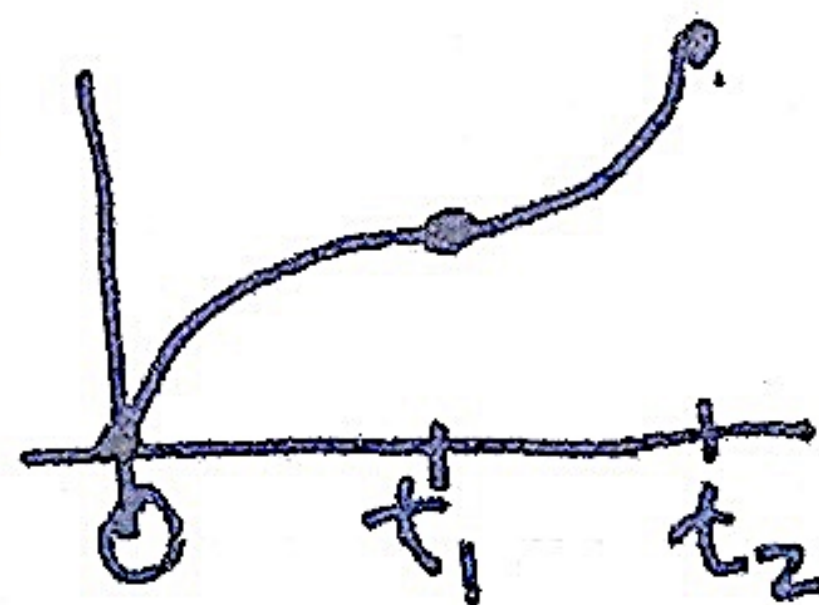


WATER
IN
VASE

From 0 to t_1 , the water rises
at a(an) _____ rate.

From t_1 to t_2 , the water rises
at a(an) _____ rate.

#86

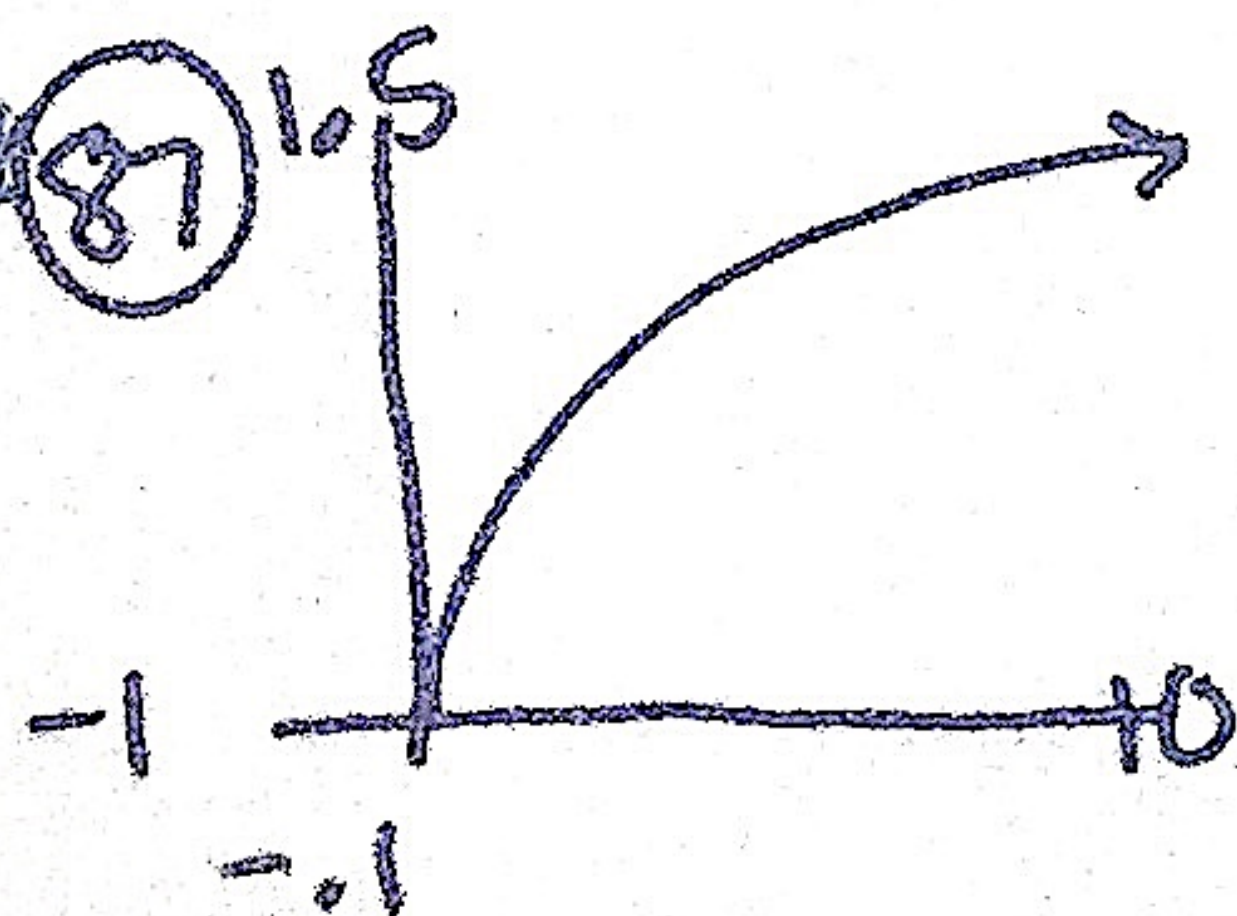


WATER
IN
VASE

From 0 to t_1 , the water rises
at a(an) _____ rate.

From t_1 to t_2 , the water rises
at a(an) _____ rate.

#87



$$T(t) = 0.43t^{0.43}$$

$$T'(t) = 0.1849t^{-0.57}$$

$$T''(t) = -0.105393t^{-1.57}$$

compare first derivative
values and compare second
derivative values when
 $t = 1, 2, 3, 4, 5, 6, \text{ and } 7$